

## ***In Situ Proximity GAP Monitor for Lithography***

### ***Abstract***

A method, and a system for implementing the method, for determining an exposure gap between a mask and a resist material, where the resist material is exposed to an incident energy

- 5   transmitted through exposure regions of the mask. The method includes the steps of: providing first gratings on one or more sides of a first structure defined by one or more first regions of the mask; providing second gratings on one or more sides of a second structure defined by one or more second regions of the mask; exposing the first and the second structures to the incident energy; measuring a difference between a location in the first structure and a location in the second structure; and
- 10   extrapolating the exposure gap from the difference. A mask writing tool is used to provide the first gratings and the second gratings. The step of providing the first gratings can include the step of: providing gratings on a pair of adjacent edges of an internal box structure defined by the one or more first regions. The step of providing the second gratings comprises the step of: providing gratings on a pair of adjacent edges of an external box structure defined by the one or more second regions
- 15   located opposite from the pair of adjacent edges of the internal box structure. The step of providing the first gratings includes the step of: providing gratings on a pair of opposite edges of an internal box structure defined by the one or more first regions. Also, the step of providing the second gratings includes the step of: providing gratings on a first edge of the internal box structure and on a second edge of an external box structure defined by one of the second regions, the first and the second edge being located opposite from one another.
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